

AMENDMENTS TO THE CLAIMS

Please amend the Claims as follows. Insertions are shown underlined while deletions are ~~struck through~~.

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1 (currently amended): A method for optimizing ~~in real-time~~ operation of a machine assembly while being manipulated by a user, said machine assembly comprising plural replaceable devices, each device being operated by a control module, the input-output relationship of which control module is regulated by control parameters, said method comprising the steps of:

(a) operating the ~~replaceable devices~~ machine using control modules;

(b) during step (a), optimizing ~~in real-time~~ the input-output relationship of at least one control module by coding into templates parameters fully or partially regulating the control module, said templates being subjected to heuristic processing, wherein ~~at least one fitted set of parameters is selected by evaluating output of the machine assembly is~~ evaluated based a combination of on the user's ultimate choice during the operation ~~or and~~ a preselected target used separately, to obtain at least one fitted set of parameters at each evaluation; and

(c) operating the machine assembly using the optimized control module.

2 (currently amended): The method according to Claim 1, wherein the control module comprises a main control module and an auxiliary control module for adjusting output of the main control module, and step (b) is conducted on the auxiliary control module.

3 (original): The method according to Claim 2, wherein the main control module and the auxiliary control module are arranged in series.

4 (currently amended): The method according to Claim 2, wherein the main control module and the auxiliary control module are arranged in ~~a line~~ parallel.

5 (currently amended): The method according to Claim 1, wherein the control module comprises a central control module and multiple local control modules each receiving signals from the central control module and outputting signals to the respective replaceable devices, and step (b) is conducted on the central control module.

6 (original): The method according to Claim 1, wherein the heuristic processing is evolutionary computation, and the templates are chromosomes.

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7 (original): The method according to Claim 6, wherein the control module regulated by control parameters is provided with a fuzzy inference system comprising a matrix of fuzzy rules which are regulated by preselected parameters, and the optimization step is conducted by at least one of the following:

(i) revising the fuzzy rule matrix by extracting a section from the matrix and coding elements of the section into chromosomes;

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(ii) modifying the configuration of the fuzzy rule matrix defined by membership functions by coding elements of the membership functions into chromosomes; or

(iii) changing a level of an input of the parameters and a level of an output of the fuzzy inference system by coding elements of the levels into chromosomes.

8 (currently amended): The method according to Claim 7, ~~further comprising wherein monitoring the fuzzy rule matrix in use while operating the machine, and evaluating the section extracted in (ii) or the membership functions to be modified~~ the level of the output of the fuzzy inference system in (iii) is evaluated by the user.

9 (original): The method according to Claim 1, wherein the machine assembly is a watercraft.

10 (original): The method according to Claim 9, wherein the replaceable devices include a trim apparatus and an electronic throttle.

11 (currently amended): An optimization apparatus for optimizing an operation characteristic of a unitary apparatus that can be used as a combined apparatus by combining other apparatuses used by a user, the optimization apparatus comprising:

an optimization process device for, ~~in real-time~~, optimizing the operation characteristic of the unitary apparatus, with a functional characteristic of the combined apparatus as an evaluation criterion, said optimization process device comprising:

(i) a control module regulated by control parameters for controlling operation of the unitary apparatus;

(ii) an autonomous evolutionary process unit for optimizing the operation of the control module by selecting a portion of the control parameters based on a predetermined evaluation criterion; and

(iii) an interactive evolutionary process unit for optimizing the operation of the control module by selecting another portion of the control parameters based on the user's choice during the operation of the unitary apparatus.

12 (currently amended): The optimization apparatus of Claim 11, wherein the control module is used as an auxiliary control module, and the optimization apparatus further comprises a basic control module for deciding a manipulated variable of the unitary apparatus based on predetermined input information, said auxiliary control module being arranged and connected in parallel to or in a series with the basic control module~~whereby the optimization process device optimizes control parameters of the basic control module with a control characteristic of the combined apparatus as an evaluation criterion.~~

13 (canceled)

14 (currently amended): The optimization apparatus of Claim 11, ~~wherein the optimization process device includes an optimization operation unit for performing operation with respect to a optimization technique, and further comprising an autonomous evaluation unit for evaluating with respect to optimization process based on a predetermined evaluation criterion, whereby the optimization process device controls using control parameters obtained by the optimization operation unit, and evaluating the result at the evaluation unit, carries out optimization~~the operation of the unitary apparatus and providing the evaluation to the autonomous evolutionary unit.

15 (currently amended): The optimization apparatus of Claim 11, ~~wherein the optimization process device includes an optimization operation unit for performing operation with respect to a optimization technique, further comprising an evaluation input unit for inputting by the user an evaluation of the operation of the unitary apparatus to the interactive evolutionary unit~~based on a user's intention with respect to optimization process, whereby the optimization process device controls using control parameters obtained by the optimization operation unit, and evaluating the result at the evaluation unit based on evaluation information input by the evaluation input unit, carries out optimization.

16 (original): The optimization apparatus of Claim 14, wherein the optimization operation unit carries out operation with regard to optimization using heuristics.

17 (original): The optimization apparatus of Claim 16, wherein the heuristics is an evolutionary calculation method.

18 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is a power generator for a combined apparatus, and the other apparatuses are a body of the combined apparatus.

19 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an outboard motor and the other apparatuses are a hull.

20 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an electrically-driven auxiliary power device and the other apparatuses are a bicycle or wheelchair.

21 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an electronically-controlled fuel injection device of a motor and the other apparatuses are an electronic throttle device of the motor.

22 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an electronic throttle device of a motor and the other apparatuses are an electronically-controlled fuel injection device of the motor.

23 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is a body of a robot and the other apparatuses are a head, arms and /or legs of the robot.

24 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an indoor machine of an air conditioner and the other apparatuses are an outdoor machine of the air conditioner.

25 (original): The optimization apparatus of Claim 11, wherein the unitary apparatus is an outdoor machine of an air conditioner and the other apparatuses are an indoor machine of the air conditioner.

26 (new): The method according to Claim 1, wherein the evaluation of output of the machine assembly by the user's ultimate choice and that by the preselected target are switched based on time or the user's choice.

27 (new): The method according to Claim 7, wherein the section extracted in (i) and/or the membership functions to be modified in (ii) are/is evaluated by the preselected target value.